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SECOND UNITED NATIONS CONFERENCE ON THE
LEAST DEVELOPED COUNTRIES

Preparatory process for the Conference

UNDRO disaster mitigation activities in or for the benefit of the least developed countries

Contribution by the Office of the United Nations
Disaster Relief Co-ordinator (UNDRO) */

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Office of the United Nations Disaster Relief Co-ordinator (UNDRO)

UNDRO Disaster Mitigation Activities In or For the Benefit of the Least Developed Countries.

26 March 1990

UNDRO Disaster Mitigation Activities In or For the Benefit of the Least Developed Countries.

UNDRO carries out several different types of disaster mitigation activities either in *Least Developed Countries (LDCs)* themselves, or for the benefit of LDCs. These include:

- **Disaster management research projects**
- **National projects**
- **Regional, sub-regional, and international activities**
- **Symposia, seminars, and workshops**
- **Disaster management publications**

Typical examples of such current activities, or those carried out recently by UNDRO, follow:

1. UNDRO Disaster Management Research Projects.

"Preliminary Study on the Identification of Disaster-prone Countries Based on Economic Impact"

This research project, completed in January, 1990, was carried out primarily for the UNDP Governing Council, in connection with preparations for its 5th programming cycle. Several members of the Council had suggested that its calculations should include a supplementary consideration of whether or not a country is disaster-prone. At the request of UNDP/PCO, UNDRO undertook this preliminary study in order to determine whether it is feasible to develop such a quantitative measure of *disaster-proneness.*

The objective of the study was to attempt to devise a quantitative measure which will identify the degree to which a country is disaster-prone. Such a measure was to be based on objective, simple, universal criteria. Particular attention was paid in this study to ***Least Developed Countries (LDCs)*** (as well as to *Island Developing Countries (IDCs)*).

The result of the study was the development of such a measure, called a ***disaster-proneness index*** which although only preliminary, appears promising for UNDP's consideration in the 5th programming cycle. This will benefit LDCs by providing a basis for disaster mitigation efforts to be included in individual projects to be carried out in the development planning process for the benefit of those countries.

The index selected as a measure of disaster-proneness was the damage caused by the disaster as a percentage of its total annual Gross National Product (GNP). After empirical trials with several countries, a threshhold of 1% of total annual GNP was decided upon in order for a disaster to be considered a ***significant disaster***, and thus be included in the calculation of the index for a given country. This threshhold appears to be sufficient to include most disasters which can be considered to have had a major effect on the country in question.

An index was calculated for every such disaster which occurred during the approximately twenty-year period January, 1970 to July, 1989, for which sufficient information was available either to compute or to estimate such an index. The index was calculated for each disaster which occurred during the period in question which equalled or exceeded the established threshhold. A ***Total Index*** and an ***Average Index*** for each country were then computed as possible measures of its disaster-proneness.

The Total Index is the sum of the indices of each significant disaster which occurred in the country during the period studied. It thus measures the ***total effect over twenty years*** of damage suffered by that country, as a percentage of one year's total annual GNP.

The Average Index is the average of the indices of all significant disasters which occurred in the country during the period studied. It thus measures the effect of the ***average significant disaster*** which struck the country during the twenty-year period of the study, as a percentage of its total annual GNP.

Some 195 countries and territories were examined in the course of the study, including all forty-two defined by UNCTAD to be ***Least Developed Countries (LDCs)*** (as well as the fifty-one defined as *Island Developing Countries (IDCs)*). Of those, sufficient information was available, or could be estimated, to compute the total disaster-proneness index and the average disaster-proneness index for 133 of them, including twenty-nine of the LDCs (and thirty-three of the IDCs).

The results of the computations for the LDCs are summarized in the Tables on the following pages. (Copies of the complete study, including the results for ***all*** countries which were examined, can be obtained from UNDRO, Geneva.)

Table 1, *"Summary - LDC 'Disaster-Proneness' Index (1970-1989)"*, lists all forty-two LDCs examined, in simple alphabetical order, and shows, *inter alia*, the Total Index and Average Index for each such country. This Table also indicates those LDCs for which insufficient information was available either to compute or to estimate an Index.

Table 2, *"LDC Summary by Index"*, lists the LDCs in ***descending order of Index***, once by ***Total Index*** and once by ***Average Index***, for all those LDCs for which an Index could be computed or estimated. (Details on ***each*** *"significant"* disaster within each country, are included in the Annex to the complete report available from UNDRO.)

2. UNDRO National Disaster Mitigation Projects.

Table 3 lists some of the LDCs in which UNDRO has recently carried out, or continues to carry out disaster mitigation projects, including the names of the countries and descriptions of the projects. Somewhat more detailed descriptions of several typical ones among them follow as examples, in alphabetical order by country:

- **Bangladesh:**

Ten major floods struck Bangladesh between 1954 and 1987. Floods in 1988 surpassed all records in their severity and intensity. The cumulative experience gained from these successive tragedies called for an immediate action plan in order to respond effectively to natural disasters; in particular, floods. In view of this, the Government of Bangladesh called on UNDRO for technical assistance in the design and implementation of a Comprehensive Five-Year Disaster Preparedness Programme. The six major areas to be considered in this project, along with their major objectives are:

1) Administration of disaster preparedness at the national level.

To enhance the support and coordination of agencies which have responsibility for disaster preparedness in order to increase their collective effectiveness. To create an Office of Disaster Preparedness from among those agencies to act as a permanent task force in this discipline.

2) Upazila (local level) emergency relief planning.

This is to be the action area of preparedness activities whose functions will be: vulnerability mapping; updating of existing guidance manuals and the preparation of new ones; involvement of community leaders, local officials, NGOs, and local populations.

3) Evaluation of relief operations.

Measurement of the impact of disasters including the extent to which affected populations receive the required assistance and the evolution of appropriate related relief/development policies.

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4) Evaluation of disaster response.

Evaluate both the Government response and the popular response. Evaluation to cover both pre-disaster preparedness actions and post-disaster emergency actions. At all administrative levels with respect to the Government response, and that of individuals, communities, and NGOs/PVOs with respect to the popular response.

5) National disaster management handbook.

Creation of a handbook to cover the types and spread of hazards, the declaration of national emergencies, the national warning system, the philosophy and strategy of the preparedness plan, community preparedness, evacuation planning, the role of Government departments and agencies, emergency action, post-disaster recovery, evaluation and monitoring procedures, and training.

6) Local emergency planning guidelines.

Develop a handbook of guidelines for emergency planning for the guidance of local preparedness groups. To cover planning objectives, the use of resources, vulnerability mapping, hazard mapping, public awareness, warning dissemination, mobilization of volunteers and relief material, coordination between public and private bodies, linkages between communities, union, upazila and national plans, and self-assessment/evaluation procedures.

- **Djibouti:**

On the first of June, 1989, UNDRO received a request from the Government of Djibouti for technical assistance in the area of the country's operational capacity in disaster emergency situations, and to reactivate "Plan ORSEC", Djibouti's national disaster preparedness plan. As an immediate response to the Government's request, UNDRO mounted a consultancy mission to Djibouti later that year, financed by UNDP, which had the following overall objectives:

To update and enhance "Plan ORSEC".

To evaluate requirements in human and material resources.

To describe the precise functions and responsibilities of the various agencies dealing with disaster management.

To establish coordination mechanisms.

To establish a methodology to analyze the economic repercussions of damage caused by disaster emergency situations in the country.

To recommend the acquisition of required material and equipment.

The mission was completed in late 1989 and a report including recommendations in all areas studied was submitted to the Government of Djibouti for its consideration. UNDRO stands ready to provide technical assistance in the implementation of those recommendations once the Government has had an opportunity to study the consultant's report and decide on priority follow-on activities.

- **Haiti:**

A new initiative was launched in 1989 to assist the National Predisaster Planning and Relief Office to develop its capacity in disaster preparedness. A four-week consultancy mission was undertaken to identify technical assistance needs in disaster management and relief co-ordination. Detailed cyclone preparedness plans will be made for two of the most vulnerable regions. The project has four principal objectives:

Training of non-administrative personnel of OPDES, the national organization responsible for disaster management, in damage evaluation, relief co-ordination at both the local and national level, prevention activities, and the management of the different types of disasters to which Haiti is prone.

The establishment of a mechanism permitting greater cooperation between Haitian authorities and the international disaster management community.

The definition of criteria for the participation of local vulnerable populations in disaster preparedness.

The formulation of a methodology, including certain standards, in order to take into account the idea of vulnerability to natural disasters in the planning and management of development projects.

The project document is now being completed and activities are planned to begin in 1990.

- **Maldives:**

In 1987, several tidal waves, one of them the highest in many years, struck the Maldives, causing extensive damage to the entire archipelago.

With financial support from the Netherlands, and as an initial step, UNDRO provided a civil engineer to the Government of the Maldives to review the damage suffered and the repairs required, and to formulate an outline plan for the improvement of coastal defenses against such disasters.

In 1988 another UNDRO consultant, supported by UNDP, began working with the Government to review overall past and anticipated national and international mitigation efforts, in order to take stock of resources in hand, committed, or pledged, and to identify outstanding assistance needed on the basis of the tidal wave hazard, the likelihood or recurrence, and the population, property, and resources at risk and vulnerable.

The conclusions reached, including an overall assessment of risk and vulnerability, the definition of a national plan of action, and the identification of related needs in technical assistance, expertise, material and financial resources, were made available for consideration by the UNDP Round Table for the Maldives held in 1989.

- **Nepal:**

Lying on the slopes of the Himalayan Mountain range, traversing an active seismic belt, and suffering from erratic climatic conditions, Nepal is a disaster-prone country. Every year micro disasters, landslides, floods, fires, droughts, minor earthquakes, etc., hit various parts of the country, with a peak of disaster occurrences during the monsoon season from June/July to September/October. Macro disasters also strike with disturbing frequency, including, as recent examples, earthquakes in 1980 and 1988, and severe floods in 1983, 1985, and 1987.

As a result of this situation, and in response to a request from the Government of Nepal, UNDRO launched a project entitled, "Institutional Support to the Disaster Preparedness Plan", financed by UNDP.

The immediate objective of the project is to improve the Government's capability to respond effectively to disasters of varying nature and gravity in order to mitigate their effects. The development objectives to which the project contributes are:

To minimize in the short term the intensity and duration of the hardships and losses suffered by the populations of disaster-affected areas through the formulation and implementation of a Comprehensive National Disaster Preparedness and Relief Plan (NDPRP).

To reduce in the long term the recurrence of micro and creeping disasters through the application of a set of concerted environmental protective and disaster prevention policies and measures.

These objectives will be accomplished primarily by the establishment of a Special Disaster Coordination Unit (SDCU), and the preparation of a National Disaster Preparedness and Relief Plan. The SDCU will contain an Emergency Control Centre (ECC) as a structured, operational unit within the Home Ministry. It will be capable of implementing the policies of the Central Relief Committee (CRC) concerning all aspects of disaster preparedness and relief, and of coordinating disaster relief operations in conjunction with the key disaster management agencies. Besides the ECC, which will function as a focal point and communications centre within the SDCU, the unit will comprise three sections:

Planning and administration, including research.
Operations and rehabilitation.
Coordination and liaison.

The National Disaster Preparedness and Relief Plan will include disaster preparedness plans, contingency measures, and procedures, as well as the definition of the responsibilities of the various disaster management units, in order to insure the proper levels of response to macro, micro, and creeping disasters.

3. UNDRO Regional, Sub-regional, Inter-regional, and International Disaster Mitigation Activities.

Table 4 lists some of the regional disaster mitigation projects which UNDRO has recently carried out, or continues to carry out, which either involve LDCs or are of benefit to LDCs. The Table includes the region and a description of the project. Somewhat more detailed descriptions of three typical ones among them follow, as examples:

- **Caribbean Region - PCDPPP:**

The Pan-Caribbean Disaster Preparedness and Prevention Project (PCDPPP) is based in Antigua and serves the disaster management needs of twenty-nine participating States and Territories, including several Least Developed Countries. The project, which was initiated in 1981, is managed by UNDRO and is implemented in collaboration with the Pan-American Health Organization of the World Health Organization (PAHO/WHO) and the League of Red Cross and Red Crescent Societies (LRCS).

Since 1981 a variety of initiatives have been launched . These have resulted in an increased capacity for disaster management at the national and regional levels. These include training of personnel, technical assistance, surveys of vulnerable areas, the creation and activation of national disaster preparedness offices, and the improvement of emergency telecommunication systems. The Project's recent activities have focused on hazard mapping programmes in risk areas, the improvement of resistance of buildings to earthquakes and hurricanes by training building contractors and inspectors, the implementation of public awareness measures, and the setting up of a regional disaster information centre.

The programme also includes technical assistance for the development of national emergency policies and contingency plans, training in hurricane shelter procedures, and damage assessment and simulation exercises.

The Project serves as a regional pool of expertise in the Caribbean and as a focal point for the sharing of experiences and the promotion and co-ordination of efforts undertaken in the disaster mitigation field.

The Project will phase out by the end of 1990. During this year two studies are to be made to pave the way for a regional mechanism to fulfill the functions carried out by PCDPPP:

A Caribbean Community (CARICOM)/PCDPPP mission will identify the functions and location of a regional disaster response focal point. Its report will be submitted to the Conference of the Heads of Government of the Caribbean Community.

An independent evaluation of the programme of three PCDPPP components (UNDRO, PAHO, LRCS) during the period 1988-1989, which will contain a project audit and recommendations for a regional disaster management mechanism.

It will be the task of the PCDPPP to see in what way the recommendations of the two studies may be merged in order to lay the foundation for a regional approach encompassing disaster response and diaster mitigation.

- **Southern Africa Sub-region:**

An UNDRO project has been launched in the Southern Africa Sub-region to strengthen the disaster preparedness capabilities of three of the most disaster-prone countries there, including two LDCs. Individual projects have been developed for each of the countries involved. Descriptions of the projects in the two LDCs involved, Lesotho and Malawi, follow:

1) Lesotho

Lesotho is historically prone to certain types of disasters owing to its geographical location, the character of its terrain, and its stage of development. The most serious of these disasters, with regard to severe damage and human suffering, are snowstorms and rainstorms followed by floods, and the resulting isolation of vast areas of the country. The acute emergency phase in cases of such disasters is of short duration (several days) as a rule, but the stricken areas may remain isolated to some degree for up to a month; thus, the indigenous populations of those areas normally require relief assistance during that entire extended period.

This situation has led to the decision to review the present system for disaster preparedness in the Kingdom of Lesotho, with the objective of improving its capacity by developing a comprehensive National Plan for Disaster Preparedness and Relief. This was accomplished by an UNDRO-sponsored mission in late 1988. The National Plan which resulted from this mission has now been accepted by the Government of Lesotho and a project is presently underway to initiate its implementation.

A three-man UNDRO mission to Malawi (as well as to Lesotho and Zimbabwe) in the framework of this project has recently returned to Geneva and completed its report. As a result of the observations of this mission, a proposal has already been completed calling for an expansion of the original project objectives.

The overall objective of this follow-on project is to enhance the capabilities of those personnel concerned with operational planning and emergency management, according to the National Plan, by means of appropriate training for such officials, in order to result in a general improvement of disaster preparedness in the country.

The immediate, short-term objectives leading up to the accomplishment of the overall objective, are to:

Upgrade the National Plan for Disaster Preparedness and Relief.

Create an effective emergency management structure.

Establish the required training program to upgrade the capabilities of officials dealing with disaster management.

2) Malawi

Malawi has also suffered from serious disasters in the recent past. As late as 1989, for example, the country was struck by both serious flooding, leaving an estimated 100,000 people homeless, and an earthquake which seriously damaged many private and government structures.

As one of the countries involved in this Southern Africa Sub-region project, UNDRO had prepared a draft National Disaster Preparedness Plan for Malawi, which was presented to the Government for its consideration in late 1988. In February of this year, UNDRO sent another mission to the country (as well as to Lesotho and Zimbabwe) in the framework of this project, which has now returned to Geneva after completing its work. The general purpose of the mission was to promote disaster preparedness activities in the country, by:

Discussing the approval of the draft National Disaster Preparedness Plan.

Developing a plan of action for disaster preparedness activities.

Examining the extent to which the Disaster Preparedness Plan was applied during the 1989 floods and earthquake.

Discussing the possibility of establishing a permanent disaster preparedness structure.

The mission noted that the recommendations made in the draft preparedness plan of late 1988, had not yet been implemented at the time of the flood emergency in 1989. One result was that the large-scale relief operations which followed those floods had to be improvised to a certain extent, and they were therefore probably not as effective as they would have been otherwise. However, this experience did serve as an impetus to implement certain portions of the plan, and gradually a number of measures were taken to rectify the situation, with the following positive results to date:

Formation of a National Disaster Preparedness and Relief Committee and specialized sub-committees.

Formation of Regional and District Disaster Preparedness and Relief Committees.

Appointment of three permanent Regional Relief Officers.

Appointment of District Relief Officers, adding responsibility for preparedness and relief matters to their ordinary duties.

Establishment of an operational provisional Emergency Management Unit, with a National Co-ordinator and two Assistant Co-ordinators and supporting staff.

As a result of the observations of the mission, a proposal has already been completed calling for an expansion of the original project objectives, which was developed in close cooperation with certain Malawi authorities, and which will be forwarded to the Government for its acceptance, as was done also in the case of Lesotho. The expanded project will include the completion of the National Plan, the initiation of related legislation and sectoral planning, and a comprehensive training program reflecting the endeavor to reach out to local communities in order to create improved public awareness and encourage self-help and mitigation measures.

- **South Pacific Region:**

Towards the end of 1987, UNDRO began to lay the groundwork for a disaster mitigation programme for the Pacific region. Discussions were held with Government representatives, the South Pacific Bureau for Economic Co-operation (SPEC), and the regional UNDP Office in Fiji.

The main objective of the programme is the strengthening of the capability of the Pacific Islands to cope with disasters, particularly those caused by cyclones.

Activities proposed include the training of local officials responsible for disaster emergencies in disaster management techniques, both within the countries and abroad, and updating of national disaster preparedness plans, emergency communication facilities, and community preparedness.

The programme is to be established in Fiji in close collaboration with the regional tropical cyclone project of the World Meteorological Organization (WMO) based in Nadi, as well as with organizations providing bilateral disaster preparedness assistance in the region.

4. UNDRO Symposia, Seminars, and Workshops in Disaster Management.

Table 5 lists some of the regional disaster management seminars and workshops which UNDRO has recently either organized, sponsored, or participated in. These seminars and workshops all included participants from LDCs, some of whom participated thanks to an UNDRO grant.

5. UNDRO Publications Dealing with Disaster Management.

Table 6 lists the kinds of publications produced by UNDRO which deal with disaster management and which are available and of benefit to LDCs in disaster mitigation programs in those countries.

TABLE 1: SUMMARY - LDC "DISASTER-PRONENESS" INDEX (1970-1989)

COUNTRY	POPULATION (1980)	GNP (1980) PER CAPITA	GNP (1980) TOTAL ($MIO)	SIGNIFICANT DAMAGE (1% GNP)	NO. OF EVENTS	INDEX TOTAL	INDEX AVERAGE
AFGHANISTAN	15,940,000	$ 170 (2)	$ 2,710	$ 27,100,000	6	27.10	4.52
BANGLADESH	88,513,000	$ 130	$ 11,030	$ 110,300,000	7+	50.32+	7.19-
BENIN	3,479,000	$ 290	$ 1,020	$ 10,200,000	2-	(1)	(1)
BHUTAN	1,273,000	$ 80	$ 100	$ 1,000,000	0+	(1)	(1)
BOTSWANA	901,000	$ 880	$ 800	$ 8,000,000	6	10.13	1.69
BURKINA FASO	6,161,000	$ 200	$ 1,250	$ 12,500,000	4	191.23	47.81
BURMA	33,313,000	$ 170	$ 5,630	$ 56,300,000	1+	1.71+	1.71-
BURUNDI	4,114,000	$ 210	$ 850	$ 8,500,000	1-	(1)	(1)
CAPE VERDE	295,000	$ 310	$ 90	$ 900,000	2	12.06	6.03
CENTRAL AFRICAN REP.	2,330,000	$ 310	$ 710	$ 7,100,000	1-	(1)	(1)
CHAD	4,455,000	$ 110	$ 490	$ 4,900,000	5+	92.04+	18.41-
COMOROS	347,000	$ 290	$ 100	$ 1,000,000	3	61.18	20.39
DJIBOUTI	352,000	$ 460	$ 160	$ 1,600,000	5+	9.82+	1.96-
EQUATORIAL GUINEA	341,000	$ 180 (1981)	$ 62 (1981)	$ 620,000	1-	(1)	(1)
ETHIOPIA	31,065,000	$ 130	$ 4,080	$ 40,800,000	7+	60.82+	8.69-
GAMBIA	574,000	$ 360	$ 210	$ 2,100,000	2	14.79	7.37
GUINEA	5,425,000	$ 280	$ 1,520	$ 15,200,000	1-	(1)	(1)
GUINEA BISSAU	773,000	$ 170	$ 130	$ 1,300,000	0	0.00	0.00
HAITI	5,009,000	$ 280	$ 1,420	$ 14,200,000	2+	9.21+	4.61-
KIRIBATI	59,000	$ 390	$ 20	$ 200,000	0	0.00	0.00
LAOS	3,426,000	$ 70	$ 240	$ 2,400,000	1+	17.98+	17.98-
LESOTHO	1,341,000	$ 470	$ 630	$ 6,300,000	3-	(1)	(1)
MALAWI	6,037,000	$ 190	$ 1,160	$ 11,600,000	1+	2.36+	2.36-
MALDIVES	152,000	$ 260	$ 39	390,000	0	0.00	0.00

TABLE 1: SUMMARY - LDC "DISASTER-PRONENESS" INDEX (1970-1989) (cont'd)

COUNTRY	POPULATION (1980)	GNP (1980) PER CAPITA	GNP (1980) TOTAL ($MIO)	SIGNIFICANT DAMAGE (1% GNP)	NO. OF EVENTS	INDEX TOTAL	INDEX AVERAGE
MALI	6,699,000	$ 180	$ 1,230	$ 12,300,000	3	22.52	7.51
MAURITANIA	1,523,000	$ 400	$ 600	$ 6,000,000	4	41.15	10.28
MOZAMBIQUE	12,084,000	$ 270	$ 3,262	$ 32,620,000	2+	2.65+	1.32-
NEPAL	14,640,000	$ 140	$ 2,040	$ 20,400,000	3	16.84	5.61
NIGER	5,532,000	$ 300	$ 1,670	$ 16,700,000	3+	21.53+	7.17-
RWANDA	5,168,000	$ 220	$ 1,150	$ 11,500,000	3-	(1)	(1)
SAMOA, WESTERN	156,000	$ 350	$ 54	$ 540,000	2-	(1)	(1)
SAO TOME & PRINCIPE	113,000	$ 380	$ 40	$ 400,000	1-	(1)	(1)
SIERRA LEONE	3,474,000	$ 300	$ 1,030	$ 10,300,000	0	0.00	0.00
SOMALIA	4,272,000	$ 260	$ 1,110	$ 11,100,000	9-	(1)	(1)
SUDAN	18,681,000	$ 360	$ 6,740	$ 67,400,000	1+	5.56+	5.56-
TANZANIA	18,534,000	$ 270	$ 4,890	$ 48,900,000	0	0.00	0.00
TOGO	2,578,000	$ 350	$ 900	$ 9,000,000	1-	(1)	(1)
TUVALU	8,000	$ 630	$ 5	$ 50,000	0	0.00	0.00
UGANDA	12,630,000	$ 200	$ 2,490	$ 24,900,000	6-	(1)	(1)
VANUATU	117,000	$ 380	$ 40	$ 400,000	4	228.41	57.74
YEMEN ARAB REP.	7,039,000	$ 430	$ 3,000	$ 30,000,000	1+	66.67+	66.67-
YEMEN, P.D. REP.	1,907,000	$ 420	$ 810	$ 8,100,000	4	29.05	7.26

KEY TO SYMBOLS APPEARING IN TABLE 1:

N.A. = INFORMATION NOT AVAILABLE
(1) = INSUFFICIENT INFORMATION AVAILABLE TO COMPUTE OR ESTIMATE INDEX
(2) = ESTIMATE
\+ = COULD BE HIGHER, DEPENDING ON MISSING INDEX INFORMATION
\- = COULD VARY, DEPENDING ON MISSING INDEX INFORMATION

TABLE 2 - LDC SUMMARY BY INDEX

DESCENDING ORDER BY TOTAL INDEX:		DESCENDING ORDER BY AVERAGE INDEX:	
1. VANUATU (4)	228.41	1. YEMEN ARAB REP. (1+)	66.67-
2. BURKINA FASO (4)	191.23	2. VANUATU (4)	57.74
3. CHAD (5+)	92.04+	3. BURKINA FASO (4)	47.81
4. YEMEN ARAB REP. (1+)	66.67+	4. COMOROS (3)	20.39
5. COMOROS (3)	61.18	5. CHAD (5+)	18.41-
6. ETHIOPIA (7+)	60.82+	6. LAOS (1+)	17.98-
7. BANGLADESH (7+)	50.32+	7. MAURITANIA (4)	10.28
8. MAURITANIA (4)	41.15	8. ETHIOPIA (7+)	8.69
9. YEMEN, P.D. REP. (4)	29.05	9. MALI (3)	7.51
10. AFGHANISTAN (6)	27.10	10. GAMBIA (2)	7.37
11. MALI (3)	22.52	11. YEMEN, P.D. REP. (4)	7.26
12. NIGER (3+)	21.53+	12. BANGLADESH (7+)	7.19-
13. LAOS (1+)	17.98+	13. NIGER (3+)	7.17-
14. NEPAL (3)	16.84	14. CAPE VERDE (2)	6.03
15. GAMBIA (2)	14.79	15. NEPAL (3)	5.61
16. CAPE VERDE (2)	12.06	16. SUDAN (1+)	5.56-
17. BOTSWANA (6)	10.13	17. HAITI (2+)	4.61-
18. DJIBOUTI (5+)	9.82+	18. AFGHANISTAN (6)	4.52
19. HAITI (2+)	9.21+	19. MALAWI (1+)	2.36-
20. SUDAN (1+)	5.56+	20. DJIBOUTI (5+)	1.96-
21. MOZAMBIQUE (2+)	2.65+	21. BURMA (1+)	1.71-
22. MALAWI (1+)	2.36+	22. BOTSWANA (6)	1.69
23. BURMA (1+)	1.71+	23. MOZAMBIQUE (2+)	1.32-

NOTES

1. THE FOLLOWING LDCS HAD NO SIGNIFICANT EVENTS DURING THE PERIOD 1970-1989, AND THEREFORE HAD A TOTAL INDEX = AVERAGE INDEX = 0.00 :

   GUINEA BISSAU, KIRIBATI, MALDIVES, SIERRA LEONE, TANZANIA, AND TUVALU

2. FOLLOWING ARE THE LDCS EXAMINED IN THE STUDY FOR WHICH INSUFFICIENT INFORMATION WAS AVAIALBLE EITHER TO COMPUTE OR TO ESTIMATE AN INDEX:

   BENIN, BHUTAN, BURUNDI, CENTRAL AFRICAN REP., EQUATORIAL GUINEA, GUINEA, LESOTHO, RWANDA, WESTERN SAMOA, SAO TOME & PRINCIPE, SOMALIA, TOGO, UGANDA.

KEY TO SYMBOLS USED IN TABLE 2

\+ = COULD BE HIGHER, DEPENDING ON MISSING INFORMATION ON INDIVIDUAL DISASTERS
\- = COULD VARY, DEPENDING ON MISSING INFORMATION ON INDIVIDUAL DISASTERS
(n) = NUMBER OF SIGNIFICANT EVENTS WHICH OCCURRED DURING THE PERIOD 1970-1989

TABLE 3: UNDRO NATIONAL DISASTER MITIGATION PROJECTS IN OR FOR THE BENEFIT OF LDCS

COUNTRY	PROJECT TITLE / DESCRIPTION	DATES START	DATES END
AFGHANISTAN:	1. Seismic hazard assessment and forecasting.	1985	1985
	2. Programme support to Office of Emergency Preparedness.	1/90	2/90
BANGLADESH:	Flood Prevention Project. Elaboration of a comprehensive five-year program in disaster preparedness. (Details included in Secretary-General's Report.)	1989	1994
CHAD:	Strengthening of Relief Co-ordination and Information Centre for Emergencies through installation of computer system.	1985	1985
DJIBOUTI:	Update the Djibouti disaster management plan, review additional human resources, equipment, and coordination mechanisms required to facilitate its effective implementation.	1989	1989
GUINEA:	Emergency component of National Reconstruction Programme.	1985	1985
HAITI:	1. Disaster mitigation project.	1987	1987
	2. Assist National Pre-disaster Planning and Relief Office to develop its capacity in disaster preparedness.	1989	1989
	3. Disaster preparedness and prevention project.	1990	1992
MALDIVES:	Review preparedness and prevention measures in connection with coastal flooding. (Details included in Secretary-General's Report.)	1988	1988
MALI:	National disaster preparedness and prevention planning	1985	1985
MOZAMBIQUE:	Strengthening national disaster prevention and counter-disaster operations. Advice on assessment of vulnerability to floods and drought, formulation of disaster prevention and preparedness plans, organization of disaster management units, definition of responsibilities, operational planning and in-service training, and related matters.	1984	1984
NEPAL:	1. National disaster preparedness and prevention planning	1985	1985
	2. Institutional Support to Disaster Preparedness and Relief Plan. Assist the Ministry of Home, and the Special Disaster Unit of the Ministry, in the development of their National Disaster Preparedness Plan. Arrange for training of staff of Unit and organize in-country training seminars. An emergency Control Centre has been developed to improve communication and coordination mechanisms in times of crisis.	5/87	12/90
NIGER:	Disaster mitigation project.	1987	1987
SUDAN:	Establishment of disaster management center. Specify, acquire computer equipment, develop software, install system and train staff.	1985	1986
VANUATU:	Inter-agency mission, followed by project on improvements in national disaster preparedness structure.	1984	1985

TABLE 4: UNDRO REGIONAL, SUB-REGIONAL, AND INTERNATIONAL DISASTER MITIGATION ACTIVITIES

REGION	PROJECT TITLE / DESCRIPTION	DATES START	DATES END
AFRICA:	Regional meeting on Disaster Prevention and Preparedness in Africa. Measures to mitigate harmful impact of disasters other than drought on economic and social development. (Several LDC participants.)	1984	1984
AFRICA (WEST AND CENTRAL):	Participation in "The Institution and Co-ordination of National Contingency Plans for Emergencies Associated with Industrial Installations in the West and Central African Region", and in regional workshop on this subject. (Several LDCs involved.)	1984	1984
ASIA:	Administrative Staff College of India. Collaboration in training and research activities in disaster management, both in curriculum development and sponsorship of regional participants in their training courses. (Benefits LDCs.)	1977	--
ASIA:	Asian Disaster Preparedness Centre (ADPC). The Centre was created as an UNDRO collaborating centre as part of the Asian Institute of Technology in Bangkok. It is a regional training centre in disaster management and receives ongoing support from UNDRO. (Benefits both LDCs and IDCs.)	1986	--
CARIBBEAN:	Pan-Caribbean Disaster Preparedness and Prevention Project. Multi-agency project covering 29 island countries and territories in the Caribbean, for disaster prevention, preparedness, and communication.	9/81	12/90
	(Participating countries include mostly IDCs, some of which are also LDCs)		
EUROPE:	Pisa Emergency Relief Goods Stockpile. Creation, expansion of UNDRO warehouse to pre-position stockpiles of emergency relief goods in the United Nations Supply Depot in Pisa, Italy. (Benefits both LDCs and IDCs.)	1984	--
INTER-AGENCY:	Panel on Tropical Cyclones. Develops disaster prevention and preparedness projects, including workshops and seminars, on tropical cyclones. (Benefits both LDCs and IDCs.)	1974	--
	Regional Seminar on Disaster Preparedness.	1984	1984
INTER-AGENCY:	United Nations Industrial Development Organization (UNIDO). Collaboration in studies to reduce hazards created by industrial activities. (Benefits LDCs.)	1985	1985
INTER-AGENCY:	United Nations Environment Programme (UNEP). Joint UNEP/UNDRO production of "Compendium on Disaster Prevention and Mitigation" ("Preparedness Aspects" published 1984). (Benefits both LDCs and IDCs.)	1984	--
	Collaboration in studies on reducing the effects on the environment which result from major accidents. (Benefits both LDCs and IDCs.)	1985	1985
INTER-GOVERNMENTAL:	Typhoon Committee. An inter-governmental organization to reduce the effects of typhoons through improved forecasting of typhoons and floods, and disaster prevention and preparedness. (Benefits both LDCs and IDCs.)	1968	--

TABLE 4: UNDRO REGIONAL, SUB-REGIONAL, AND INTERNATIONAL DISASTER MITIGATION ACTIVITIES (cont'd)

REGION	PROJECT TITLE / DESCRIPTION	--- DATES -- START	END
INTER-GOVERNMENTAL:	TOPEX (Typhoon Operational Experiment). Participation in Warning Dissemination and Information Exchange component of TOPEX, a project of the Typhoon Committee. (Benefits both LDCs and IDCs.)	1981	1984
INTERNATIONAL:	International Programme for the Protection of Urban Centres from Earthquakes. Programme to train and inform specialists and the public on measures to reduce earthquake losses in densely-built urban areas constituting homogeneous or continuous structural systems. (Benefits LDCs and IDCs).	1984	--
	International seminar on post-earthquake measures for structural engineering and physical planning.	1985	1985
INTERNATIONAL:	Draft Convention on Removal of Legal Obstacles to the Delivery of Emergency Relief Supplies. Proposed convention to expedite the delivery of relief supplies, submitted to Thirty-Ninth Session of General Assembly. Revisions in progress. (Benefits LDCs and IDCs.)	1984	--
INTERNATIONAL:	International Decade for Natural Disaster Reduction. To provide a framework for national and international projects on disaster mitigation. Participation in preparations for the Decade, including the temporary Secretariat and acting as the United Nations focal point for Decade activities. (Benefits LDCs and IDCs.)	1987	--
SOUTHERN AFRICA:	Strengthening of disaster preparedness.	8/90	7/92
	(Includes Lesotho, Malawi - both LDCs - and Zimbabwe)		
SOUTHERN ASIA:	Disaster Management Training Programme for South Asian Countries. Financing of	1983	1986
	participation of disaster relief officials from several countries, including LDCs.		
SOUTH PACIFIC:	Disaster Preparedness and Prevention Programme.	3/90	2/92
	(Includes mostly IDCs; some are also LDCs)		
SOUTHWEST INDIAN OCEAN:	Tropical Cyclone Committee for the Southwest Indian Ocean. Regional body (eight countries) to reinforce national capabilities in regional cooperation in fore-forecasting tropical cyclones and in the dissemination of warnings. (Benefits both LDCs and IDCs.)	1984	1984
	Training seminar in disaster prevention and preparedness.	1984	1984

TABLE 5: UNDRO DISASTER MITIGATION SYMPOSIA/SEMINARS/WORKSHOPS

(Not mentioned elsewhere under specific projects)

REGION	PROJECT TITLE / DESCRIPTION	DATE
EUROPE:	Ibero-Maghrebian Seismic Project. Seminar series of Ibero-Maghrebian Working Group of the European Seismological Commission to promote and co-ordinate research on the seismic characteristics of the area and on the reduction of losses from earthquakes in the region.	1983
INTER-REGIONAL:	Seminar Series on Earthquake Mitigation. Inter-regional series of seminars for developing countries, held in the USSR, on earthquake risk reduction and disaster management. (Participants include representatives of several LDCs.)	1986
	1. Seminar on Assessment of Earthquake Risks.	10/86
	2. Seminar on Engineering Aspects of Earthquake Risk Mitigation.	10/88
	3. Earthquake Disaster Management Project/Seminar.	10/89
	4. Assessment of Geological and Geophysical Hazards Project/Seminar.	10/90
PACIFIC:	Workshop on Post-disaster Evaluation for the Pacific Islands. (Benefits both LDCs and IDCs.)	1985

TABLE 6: OTHER UNDRO ACTIVITIES BENEFITTING LDCS - UNDRO PUBLICATIONS

(Not mentioned elsewhere under specific projects)

PUBLICATION/SERIES	DESCRIPTION
COMPENDIUM:	"Compendium on Disaster Prevention and Mitigation. UNDRO/UNEP Compendium of Current Knowledge". Twelve volumes.
GUIDELINES:	"Guidelines for Disaster Prevention". Seven volumes.
TECHNICAL REPORTS:	Series of technical monographs, manuals, reports, bulletins, etc., on new technological developments in disaster management, computerized data bases of disaster management information, the use of satellites in disaster situations including emergency communications, etc. Nineteen such documents currently in print.
"UNDRO NEWS":	Bi-monthly publication containing artcles on disaster prevention technology, pre-disaster planning, public education, assessment of relief needs, etc.
OTHER:	Other documents, brochures, etc., dealing with UNDRO and its functions. Sixteen such documents currently in print.
FILMS:	Production of a series of video films for use in disaster preparedness and prevention.